

REVIEW

## Sleep Interventions in the Treatment of Schizophrenia and Bipolar Disorder

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### ABSTRACT

Due to the effects of sleep on the central nervous system, it is thought that sleep disorders have a special importance in the onset, course and treatment of psychiatric diseases. Although the negative effects of sleep problems on the occurrence, recurrence and clinical course of psychiatric disorders are well known, it is reported that clinicians do not spend enough time for sleep problems in practice. This may be related to the fact that patients underreport their complaints for various reasons, insufficient examination time, and clinicians' lack of knowledge about the importance of the subject. Pharmacotherapy, psychological and behavioral interventions are options among the therapeutic approaches to sleep problems. But, it seems that clinicians tend to prefer pharmacological approaches for the treatment of sleep problems. However, it is important to choose the appropriate treatment option with

considering the method preferred by the patients, who already use many and high doses of pharmacological agents, the nature of the psychiatric disorder and the sleep problem. In this context, chronotherapeutic approaches such as bright light, sleep deprivation, interpersonal relations and social rhythm therapy, and cognitive behavioral therapy techniques adapted for patients with bipolar disorder can be used in the treatment of suitable patients. In this article, the current literature about sleep-related problems observed in patients with schizophrenia and bipolar disorder is reviewed comprehensively with presenting clinical phenotypes and treatment approaches.

**Keywords:** Bipolar disorder; schizophrenia; bright light therapy; sleep deprivation; chronotherapy

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### INTRODUCTION

Sleep plays a regulatory role in all functions of the central nervous system, including mood and cognitive functions (1, 2). Disruption in sleep/wakefulness rhythm is seen as both a cause and a consequence of psychiatric disorders (3, 4).

Sleep disorders are among the diagnostic criteria for both manic and depressive episodes of bipolar disorder (BD) in the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) (5). It has been reported that sleep problems persist in euthymic patients and between mood episodes (6, 7). However, it is emphasized that ongoing sleep disorders may be associated with relapse of mood episodes (7, 8), rapid cycling (9), anxiety levels, substance use (10, 11) and suicide attempts (12). Similarly, sleep problems have been found to be associated with lower quality of life (13, 14) and poor performance in neurocognitive evaluations, during both the mood episodes and euthymic periods (15, 16). Due to the effects of sleep on emotion and mood regulation (17), it is thought that sleep disorders have a special importance in the onset, course and treatment of BD (18).

Clinical studies examining the relationship between sleep and psychotic disorder report that sleep problems are common in patients with delusions and that delusions decrease with improvement of sleep problems (19–21). However, most patients with schizophrenia experience sleep problems before delusions appear (22), almost 80% of patients

**Table 1.** Common Sleep Disorders Observed in Bipolar Disorder and Schizophrenia

Bipolar Disorder	Schizophrenia
Insomnia	Insomnia
Hypersomnia	Nightmares
Circadian Rhythm Disorders	Circadian Rhythm Disorders
Delayed Sleep Phase Disorders	Restless Legs Syndrome (RLS)
Obstructive Sleep Apnea Syndrome	Periodic Leg Movements Disorder (PLMD)
Parasomnia (especially childhood)	Obstructive Sleep Apnea Syndrome (OSAS)
	Night Eating Disorders
	Narcolepsy

in the first episode psychosis have sleep disorders (23), and sleep and circadian rhythm disorders are associated with poor prognosis in high-risk groups for psychosis (24). Besides, it is known that sleep deprivation in healthy individuals can cause paranoia and hallucinations (25). Sleep disorders frequently observed in patients with BD and psychotic disorders are shown in Table 1.

Although the negative effects of ongoing sleep problems on the onset, relapse and clinical course of psychiatric diseases are well known, it is reported that clinicians do not spare enough time for investigating sleep

problems in practice (26). In this article, the current literature is reviewed in detail, and sleep-related problems observed in patients diagnosed with schizophrenia and bipolar disorder, the relationship of these problems with clinical presentation and treatment approaches are reviewed.

## EVALUATION OF SLEEP PROBLEMS IN PATIENTS WITH SCHIZOPHRENIA AND BIPOLAR DISORDER

Clinical interview or, including the opinions of the family, self-report scales, sleep diary, and sleep monitoring methods such as actigraphy can be used to determine the sleep problems of this patient group (27). In clinical interview, some complaints which are frequently encountered in these patients such as difficulty falling asleep, excessive daytime sleepiness, snoring, apnea, abnormal sleep behavior should be questioned. Self-report scales can be used in evaluating sleep problems in more detail. Utilizable scales which also have validity and reliability in Turkish are the Pittsburgh Sleep Quality Index for sleep quality, the Epworth Sleepiness Scale for evaluating excessive daytime sleepiness, the Morning-Evening Questionnaire for biological rhythm, and the Insomnia Severity Index for evaluating insomnia in more detail. If insomnia and especially circadian rhythm sleep-waking disorders are suspected, the guidelines recommend actigraphy including the weekends for at least 7-14 days, sleep and motion-sensitive smartphone applications (28), and sleep monitoring with a sleep diary (29, 30). However, it should be kept in mind that sleep monitoring applications with such as actigraphy can be difficult in situations where the activity frequency is low and a sedentary lifestyle is dominant (3).

## INTERVENTIONS FOR SLEEP PROBLEMS IN PATIENTS WITH SCHIZOPHRENIA AND BIPOLAR DISORDER

Pharmacotherapy, psychological and behavioral interventions are among the treatment options in the therapeutic approach to sleep problems (31). However, treatment choices should be made in patients with schizophrenia considering the unique conditions of this patient population. Although studies on insomnia in patients with psychiatric disorders report that in addition to concerns about drug interactions; patients do not prefer pharmacological treatment due to the high number and doses of drugs they use (32), so the treatment modality should be decided by considering patient's thoughts on this issue. However, the kind of complaints patients have about sleep determines the form of treatment. For example, in the treatment of patients with negative sleep-related cognitions, such as pre-sleep rumination (worry about sleeping or not being able to sleep), negative beliefs about the cause of sleep problems, overestimating the health impact of poor sleep, and lack of knowledge about sleep hygiene, psychotherapy interventions such as Cognitive Behavioral Therapy (CBT) may be more appropriate than a pharmacological approach in treatment (33).

### Pharmacological Approach in the Treatment of Sleep Problems in Schizophrenia Patients

It was reported that the use of paliperidone in schizophrenia patients with insomnia improves the quality of sleep without causing drowsiness during the day (34). It was shown that olanzapine did not affect Non-REM (Rapid Eye Movement) Stage 1 and 2 sleep, increased delta sleep and Stage 3, increased the amount of REM sleep, did not affect REM latency or REM number (35). Similarly, it is emphasized that quetiapine, which is frequently used by clinicians, increases sleep efficiency (36). In this context, switching from typical antipsychotics to atypical antipsychotics is a method that should be evaluated in the presence of sleep problems, especially in elderly patients with schizophrenia (37). In addition to this, zopiclone and melatonin also increase sleep efficiency in patients with schizophrenia (38).

It was also shown that intermediate-acting benzodiazepines are more effective than placebo in the treatment of some clinical symptoms such as insomnia in patients with schizophrenia (39). These drugs are generally only recommended for short-term treatment of insomnia due to the development of tolerance and addiction. However, it was reported that benzodiazepines may adversely affect slow-wave sleep and REM sleep, which could already be impaired in patients with schizophrenia (40). Besides, possible negative effects of benzodiazepines on cognitive function should also be considered. Similarly, special attention should be paid to accompanying sleep-related breathing disorder or alcohol/substance use disorder (41).

### Pharmacological Approach in the Treatment of Sleep Problems in Patients with Bipolar Disorder

With the demonstration that mood stabilizers affect the circadian rhythm, interest in the relationship between mood disorders and pharmacological agents has increased (42). In subsequent studies, it was reported that psychotropic agents may have an effect on sleep through mechanisms such as regulating suprachiasmatic nucleus activity, adapting the sleep/wake cycle and biological rhythm (body temperature, hormones), and changing the length of circadian period (43). Especially lithium is thought to show this effect by changing the suprachiasmatic nucleus neuronal activity by inhibition of GSK3 $\beta$  (Glycogen synthase kinase-3 beta) (44).

Similarly, it was reported that selective serotonin reuptake inhibitors (SSRI) generally show their effects on the circadian system by regulating the suprachiasmatic nucleus (45). However, the two-week period for SSRIs to show antidepressant effects seems to be compatible with the time taken to rearrange the disrupted circadian clock and rhythm (46). Fluoxetine provides phase progression in the activation of suprachiasmatic nucleus neurons and enables the change of the circadian system impaired in depression (47).

Theoretically, drugs that act on melatonergic receptors will also affect the circadian rhythm. Agomelatine, a melatonin agonist, showed equivalent effect to SSRIs and venlafaxine in major depression and was superior in the treatment of depression accompanied by sleep disorders (48). It is thought that main therapeutic effect of melatonin agonists is the rearrangement of the circadian rhythm. Through this mechanism, its therapeutic efficacy occurs by affecting body temperature, cortisol and other hormones (49).

In the treatment of insomnia in patients with BD, benzodiazepines, benzodiazepine receptor agonists, sedative antidepressants, anticonvulsants (topiramate, gabapentin, tiagabine), sedative antipsychotics and melatonin receptor agonists are widely used for bipolar disorder treatment (50). However, when using benzodiazepines in the treatment of sleep problems seen in bipolar disorder, as we mentioned before, side effects of benzodiazepines such as addiction, tolerance, withdrawal symptoms, daytime sedation and motor/cognitive impairment should be considered.

Benzodiazepines are frequently used together with antipsychotics in the acute phase of mania. Studies report that the use of clonazepam and lorazepam together with lithium (it is known that it does not provide a antimanic effect rapidly) is as effective as antipsychotics in the treatment of acute mania (51, 52).

### Non-drug Treatment Approaches to Sleep Problems in Patients with Bipolar Disorder and Schizophrenia

#### Chronotherapeutic Approaches

Chronobiology is the branch of science that studies the biological

activities that occur in living organisms in accordance with a certain rhythm. Basically, 4 main biological rhythms can be described according to cycle durations. Circadian rhythm for recurring events with cycles of about 24 hours, diurnal rhythm to describe different events during the day (day-night), ultradian rhythm for cycles shorter than 24 hours (REM sleep), infradian rhythm for cycles longer than 24 hours (menstrual cycle) (53). Sleep is modulated by circadian function, and circadian function abnormalities play a powerful role in the pathogenesis of BD. Due to this interaction, people diagnosed with BD tend to be evening type and sleep relatively late. This chronotype may predispose to sleep problems through a number of mechanisms, such as trying to sleep at the wrong time and not being able to calm down in the evening (54, 55). However, people with BD tend to have irregular 24-hour routines (sleep/wake cycles, social rhythm, biological rhythm) (56, 57). This situation potentially causes problems with sleep deprivation, inefficient sleep, and excessive daytime sleepiness (58).

Chronotherapy includes treatment options that emerge from the results of the studies in the field of biological rhythm, aiming to make the sleep-wake cycle and the biological-social rhythm regular. There are studies supporting that the application of chronotherapeutic treatment methods such as bright light therapy and sleep deprivation in patients with bipolar depression may pose a risk in terms of manic switch similar to other drugs with antidepressant properties, and even that it is not appropriate to be used in the acute treatment of mixed and manic episodes (59, 60). However, in a recent review examining the effectiveness of chronotherapeutic interventions in patients with bipolar disorder, it was reported that no manic shift was observed in 4 of the 5 studies comparing sham therapy and bright light therapy, and in 1 study, hypomanic change was observed in 2 out of 20 patients in the sham group and in 4 out of 18 patients who received bright light therapy (61). These findings suggest that bright light therapy in the treatment of bipolar depression has a relatively low risk of shifting to mania. The rate of sleep deprivation causing manic shift was reported to be 1.4%

in a recent study conducted (62). Nevertheless, when performing a chronotherapeutic intervention, it should be kept in mind that by using a mood stabilizer and shortening the exposure to bright light, the risk of shifting to mania can be further reduced and close monitoring for hypomanic symptoms is important.

- **Sleep Deprivation:** For patients with depressive disorder, sleep deprivation can be a fast, effective and short-term treatment option. The rapid improvement in mood after sleep deprivation, similar effects observed with REM sleep deprivation or phase progression method indicates the importance of circadian mechanisms that regulate sleep in the development of depression (63). Apart from the possible serotonergic, noradrenergic and dopaminergic mechanisms that are thought to mediate the antidepressant effect of sleep deprivation, there are several theories regarding its effects on the circadian system. Sleep deprivation practice provides mood improvement by re-adjusting the rhythm of the S process, which has the characteristics of slow wave sleep in depression and is a part of the homeostatic system. Thus, slow-wave sleep, of which intensity is reduced in depression, returns to normal with a rebound effect (64). As is known, the latency of REM sleep decreases and REM intensity increases in patients with depression. Sleep deprivation practices affect by reversing these two changes (65). The fact that sleep deprivation and REM sleep deprivation practices have antidepressant properties, as well as the ability of some antidepressants to suppress REM sleep are the findings that draw attention to the role of REM sleep in the formation of depression.

There are different interventions in the form of total sleep deprivation or partial sleep deprivation, which is applied as the individual is deprived of sleep for the whole night. Patients are left without sleep all night long and are prevented from sleeping during the day the next day. In partial sleep deprivation, the patient, who sleeps in a normal time, is awakened in the second half of the night. Antidepressant effects are observed in 50–60%

**Table 2.** Non-Pharmacological Approaches Used in the Treatment of Sleep Problems in Schizophrenia and Bipolar Disorder

Treatment Approach	Subheadings	Purpose	Potential Challenges and Warnings
Chronotherapy Approaches	Sleep Deprivation	Regularization of the sleep-waking cycle and biological-social rhythm	It is necessary to ensure that the patient does not sleep in any way during sleep deprivation.
	Bright Light Therapy		
	Dawn/Dusk Simulation Therapy		
	Dark Therapy		
	Integrative Chronotherapeutic Approaches		
Interpersonal Relationships and Social Rhythm Therapy	Determining the relationship between life events and mood changes	Ensuring regularity in daily social and biological rhythm	It may be difficult to organize daily routines in patients with acute mania.
	Establishing regular daily routines		
	Identifying the factors that disrupt social and biological rhythms in daily life and interpersonal relationships		
Modified Cognitive Behavioral Therapy for Bipolar Disorder	Stimulus Control	Re-associating the bed with sleep Creating a consistent sleep-waking schedule Reducing anticipation anxiety about not being able to sleep Raising and maintaining awareness, identifying negative thoughts that promote being awake,	It may be difficult to reduce targeted behaviors before bedtime as a part of their routine in transition to rest in patients with acute mania.
	Restricting the time spent in bed		
	Regulation of sleep-waking times		
	Transition to rest		
	Waking up		
	Cognitive interventions		

of depressive patients after total sleep deprivation. However, this effect is mostly temporary, and after the first normal sleep, 50–80% of depressive symptoms return (65, 66). While this antidepressant effect lasts for a few weeks in some patients, the risk of recurrence decreases considerably after the addition of lithium, SSRIs and light therapy (67, 68). The response to sleep deprivation seems to be independent of all diagnostic categories with endogenous-reactive, psychotic or non-psychotic, unipolar or bipolar, schizoaffective or seasonal characteristics (63).

- **Bright Light Therapy:** Although light therapy has been used in the treatment of seasonal affective disorder (depressive disorder with seasonal characteristics according to the DSM-5 classification) for many years (69), it has been reported that it can be among the first-line treatment interventions in non-seasonal depression (70). In addition to this, bright light therapy is also used in circadian sleep phase disorders such as other depressive disorders, delayed and advanced sleep phase syndromes (71).

The standard light therapy is performed by means of a light box with a power of approximately 10 thousand lux, located vertically and placed 1 meter away from the user. Appropriate time period is approximately 30–90 minutes after the patient gets up in the morning and is applied for approximately 30 minutes (72, 73). Bright light therapy should be applied at a certain rate by calculating the intensity of the light and the exposure time, similar to pharmacological therapy (73).

The phase delay hypothesis was mentioned in the etiology of seasonal affective disorder, and it was reported that the reduction in exposure time to light was a trigger factor, especially in autumn and winter (74). In the autumn and winter months, due to the prolongation of the night and the shortening of the exposure to light, the release time of melatonin extends, this initiates the energy storage process in the organism, leading to more sleep and food intake, and this process is reversed with light therapy (75). However, there are also findings showing that light therapy has an antidepressant effect by changing the circadian time. Morning light therapy causes biological events such as body temperature and plasma melatonin levels to progress in circadian rhythm (76, 77).

- **Dawn/Dusk Simulation Therapy:** Dawn/Dusk Simulation (DDS) therapy is an intervention in which relatively low intensity light is applied to mimic the natural gradual increase of light that occurs during sunrise. In the last phase of the sleep period, the patient is awakened earlier than the normal waking time and exposed to gradually increased light. DDS therapy differs from light therapy in that it is applied at bedtime and requires a lower intensity of light (78). The efficacy of DDS therapy, especially in seasonal depression, has been demonstrated in placebo-controlled studies (79). In case series studies, results showing that DDS therapy facilitates awakening, increases alertness and energy level, and has antidepressant effectiveness (80).
- **Dark Therapy:** Some studies with small sample size conducted by ensuring that patients with rapid cycling or manic periods stay in the dark between 6 p. m. and 8 a. m. report that manic symptoms decrease, lower doses of antipsychotic treatment is required and the duration of hospitalization is shortened (81, 82). However, this practice was not preferred by patients due to some difficulties. Therefore, “artificial darkness” was created by using glasses that can filter the blue wavelength in the light in subsequent studies. It was reported that this condition could physiologically help melatonin secretion by preventing light-induced suppression and facilitate falling asleep in patients with BD (83). Thus, it was emphasized that it could stabilize the daily sleep-wake cycle and affective lability (78).

## Integrative Chronotherapeutic Approaches

- **Augmentation of Antidepressant Treatment with Bright Light:** In cases of delayed or partial response to SSRI and tricyclic antidepressants, bright light therapy may be considered to be added to the current treatment. When added to citalopram and sertraline treatment, it was reported that bright light therapy strengthened and accelerated antidepressant efficacy (84).
- **Treatment of Sleep Deprivation with Medication:** It was discussed for a long time that adding sleep deprivation treatment to the treatment in patients with depression who does not respond to treatment may improve complaints (85). Although there are findings indicating that it is not effective with dopamine antagonists (86), it has been reported that lithium and many SSRIs, SNRI (serotonin and norepinephrine reuptake inhibitors) and tricyclic antidepressant drugs can be used together with sleep deprivation therapy (78). It is ideal to start sleep deprivation therapy in the early stages of treatment, since antidepressant drugs need a 2-week period to be effective, and sleep deprivation therapy has a quicker onset of action.

**Adding Sleep Deprivation and Light Therapy to Antidepressant or Mood Regulating Medications:** It was reported that adding one-night sleep deprivation and bright light therapy to the treatment of depressive patients using citalopram and BD using lithium increased the response to treatment in a very short time (67, 87).

**Combined Use of Sleep Deprivation, Light Therapy, Advanced Sleep Phase Therapy:** There are publications indicating that the administration of interventions including different chronotherapeutic combinations in addition to various antidepressants in patients with both bipolar and unipolar depression is associated with a faster, more effective and permanent effect (88).

## Negative Air Ionization

Although negative air ionization is not directly related to chronobiology, it is a non-invasive method that can positively affect mood and can be used as an adjuvant like chronotherapeutic approaches. The exact mechanism of action is unknown, and it is thought to act by increasing serotonergic activity and blood oxygenation (78). Devices that emit negative ions are used in morning hours. The duration of exposure and the intensity of ionization are important. There are studies showing that antidepressant efficacy is seen within 2 weeks after high intensity exposure for at least 30 minutes (79, 89)

## Interpersonal Relationships and Social Rhythm Therapy (IPSRT)

Social zeitgeber (rhythm determinant) theory states that stressful life events can disrupt the order of situations defined as “social zeitgeber”, such as sleep time, wake time, meal time, and as a result, mood attacks can be observed in people who are susceptible to the disease by following circadian rhythm disorders (90). Zeitgebers, which we can be described as “social timers”, are social situations that affect a biological rhythm, such as circadian rhythm, sleep-wake pattern. Factors such as interpersonal relationships, life stage, social needs can disrupt biological rhythms by affecting a social zeitgeber such as the time to fall asleep (91). However, the fast city life brought by modern life for 24 hours, flexible working hours required by intense work, shift work, delayed meal times due to traffic congestion, meals skipped to lose weight, sleep hours adjusted according to TV programs disrupts the biological rhythm (92). IPSRT is a form of psychotherapy that targets stability in daily social and biological rhythm. In IPSRT, not only biological rhythm, sleep-waking hours, but also interpersonal relationships and social roles are addressed, thus

trying to regulate the social rhythm. In the IPSRT, developed by Frank et al., determining the relationship between life events and mood changes, establishing regular daily routines, determining the factors that disrupt social and biological rhythms in daily life and interpersonal relationships, addressing the mourning of the “healthy self” that the person lost due to the disease, focuses on main issues such as the identification and management of affective symptoms (56). The psychotherapy process in IPSRT consists of four stages called initiation, intermediate, maintenance and termination periods.

### Modified Cognitive Behavioral Therapy for Insomnia (CBT-I) in Bipolar Disorder

Psychosocial techniques are among the first-line treatment options for people with psychiatric disorders, similar to those who are not ill. Even CBT techniques used in the treatment of insomnia have been modified for bipolar disorder (CBT-I-BP). By adding interpersonal and social rhythm therapy, chronotherapy and motivational interview to the classical components of CBT-I, it was aimed to improve mood, sleep and functionality in people with BD (93). Although it is reported in the related study that CBT-I-BP may be associated with a low risk of hypomania/mania relapse, in a previous study with a low sample size, moderate mood elevations are observed especially after the use of CBT-I techniques such as sleep restriction (94). While CBT-I was being adjusted for patients with bipolar disorder, some of its key components were modified. For example, in sleep restriction, the time spent in bed was limited to at least 6.5 hours. Similarly, with this approach the principle of going to bed only while sleepy for stimulus control was modified as, this could further reduce sleep time. More emphasis was placed on circadian rhythm training and the importance of variability in sleep/wake times. Thus, the activities were placed to the morning hours as much as possible. In order to prevent the delayed sleep phase seen in patients with psychiatric disorders, efforts was made to delay the sleep of patients 20–30 minutes weekly.

The main components of CBT-I-BP can be summarized as follows;

- Functional assessment/case formulation and target setting: Sleep-related behaviors and their effects on sleep are evaluated before sleeping, during sleeping, and after waking up.
- Motivational Interview: It is a method that includes regular and simple examinations about the perceived positive and negative aspects of changes in behaviors that are not compatible with sleep, in a way that avoids ineffective arguments.
- Education about sleep and circadian rhythm: It includes providing information about circadian/social rhythm, environmental stimuli, and the role of sleep disorder in mood regulation and relapses.

#### Behavioral Components:

- o *Stimulus Control*: Behavioral suggestions such as going to bed only when sleepy, getting out of bed when unable to fall asleep, using the bed only for sleep purposes, waking up at the same time every morning and avoiding naps during the day are used. Also, avoiding the use of technological devices with LED screens such as televisions, computers, phones or tablets in the bed or bedroom is among the important behavioral suggestions. It was reported that exposure to blue light emitted from LED lamps, LCD screens and LED light sources late in the evening or at night is associated with sleep disorders, psychiatric disorders, obesity, diabetes, and various types of cancer (95, 96). Recently,

it was reported that blue light from artificial light alters natural processes, inhibited melatonin production and disrupted the circadian rhythm (97). Therefore, avoiding artificial light sources is critical to maintain optimum health and well-being at night.

- o *Restricting the time spent in bed*: The aim is to limit the time spent in bed to the actual sleep time and to adapt this period gradually to the optimum sleep time (as mentioned earlier, the time spent in bed should never be less than 6.5 hours).
- o *Regulation of sleep-waking times*: It is aimed to be active in order to create a consistent sleepiness in the evening and to avoid naps during the day.
- o *Transition to rest*: In dim light conditions, it is aimed to organize a “resting” period of 30–60 minutes in which relaxing and sleep-improving activities are implemented.
- o *Waking up*: It includes behaviors such as opening curtains to allow sunlight to enter and not delaying getting out of bed.

#### Cognitive Components:

- o Through guided discovery and individualized experimentation, false beliefs about sleep (such as TV helps me to fall asleep or drugs are the most important factor in my feeling sleepy) are tested for the validity and usefulness of beliefs.
- o Worries of patients about sleep may be high –as sleep loss can cause the onset of a mood episode. However, as it is known, anxiety is a feeling that makes it difficult to start sleep. This is why personalized strategies, including cognitive therapy or a planned “anxiety time”, are used to reduce bedtime worry, rumination and vigilance. Also, patients may be asked to write a diary. Writing a diary can help identify events that cause stress. Discussing and resolving the problems expressed in this diary with the physician will prevent rumination. In fact, the diary is not only a useful tool for the patient, but also serves as an effective tool for the physician to identify problem areas during control examinations.
- Daytime coping: Often people have the idea that sleeping more is the only way to feel less tired during the day, so individuals are asked to produce a list of “energy generating” and “energy wasting” activities.
- Relapse Prevention: The purpose of this component is to reinforce the outcomes and be prepared for setbacks using a personalized summary of gains and achievements (93).

In conclusion, various sleep problems are frequently encountered in bipolar disorder and schizophrenia. Using alternative intervention techniques other than pharmacological approaches in the treatment of these problems has potential to have positive effects in the reduction of distress related to both sleep disorders and psychiatric disorders and to improve the disorder course.

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**Reasons that sleep problems are not questioned**

1. The patient's inability to express him/herself.
2. Limited examination period.
3. Physicians feel insufficient in this regard.
4. Poor awareness regarding the relationship between sleep-psychiatric symptoms.
5. Along with other "important" problems, sleep is viewed as a "negligible" or "residual" symptom.

**Relationship of Sleep and Mood**

1. Sleep disturbance is predictive in relapse and recurrence of depression. First, sleep is disturbed, and then the illness intervenes or relapses. In depression, the biological rhythm becomes irregular. Sleep delays, sleep interruptions and early awakening occur.
2. When there is a sleep disorder in depression, suicidal risk is higher.
3. As the mood disorder improves, sleep begins to improve first.
4. The manic episode of bipolar disorder may begin with a decreased need for sleep. Sleep disturbance can trigger a manic episode.
5. Mood stabilizers, especially lithium, act by regulating the biological rhythm.

**Relationship between Sleep and Psychotic Disorders**

1. Insomnia experiments have shown that delusions and hallucinations occur in healthy individuals after insomnia.
2. It is reported that patients with schizophrenia experience sleep problems before delusions appear.
3. 80% of first episode psychosis patients have a sleep disorder.
4. Sleep and circadian rhythm disturbances are associated with poor prognosis in high-risk psychosis groups.
5. Antipsychotics provide relief from psychotic symptoms by improving sleep disturbances.

**Evaluation in Sleep Problems**

1. A detailed medical history including sleep problems.
2. Self-report scales (Pittsburgh Sleep Quality Index, Insomnia Severity Index, Epworth Sleepiness Scale, Sleep Diary)
3. Getting information from the caregivers of the patients about sleep and wakefulness
4. Sleep laboratory assessments in cases with difficulties in differential diagnosis such as narcolepsy
5. Controlling the patients' medications in terms of effects on sleep

**Basic Treatment Steps for Sleep Problems**

1. First of all, reminding of sleep hygiene rules one by one
2. Correcting the false beliefs about sleep
3. Checking behavioral homework with a sleep diary
4. Choosing treatments without side effects as spill-over or excessive daytime sleepiness
5. Avoiding the prescription of benzodiazepines in chronic insomnia

**Chronotherapeutic Approaches**

1. "Sleep deprivation" intervention applied all night or in the second half of the night
2. Bright Light Therapy: It is applied with a light of 10 thousand lux magnitude.
3. Dark Therapy: Continuation of treatment in environments free from light sources during the night, especially during periods of hypomania and mania
4. Combination therapies that include sleep deprivation and antidepressants with bright light therapy
5. Chronotherapy methods applied in the form of gradual advancement of sleep and wakefulness hours in circadian rhythm sleep disorders such as delayed sleep phase syndrome

**Why Chronotherapy?**

1. The targets of chronotherapy methods are sleep related mechanisms and neurotransmitters similar to psychotropics.
2. In cases where a fast antidepressant effect is desired, it prevents the problems that may occur during the waiting period for the antidepressant effect of pharmacotherapy.
3. It is an effective treatment option in avoiding further medication use in pregnant patients or in elderly patients and in situations of polypharmacy.
4. It is a fast, effective and cost-effective biological treatment method with low side effects.
5. Its efficacy can be strengthened with combination treatments.

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